In the Specification:

Change paragraph 0021 as follows :

In accordance with the JAC invention the estimate comprises the channel estimate obtained from the previously recognized utterances and the noise estimate is obtained from the pre-utterance pause of the test utterance. Referring to Figure 1 the recognizer system 10 includes a recognizer subsystem 11, Hidden Markov Models ~~H~~ 13, a model adapter subsystem 17, a noise sensor and a microphone 15 to produce recognized speech output from the recognizer 11. The model adapter subsystem 17 includes an estimator 19 and a model adapter 21. The noise sensor 17 detects background noise during a pre-utterance pause. The estimator 19 estimates the background noise (additive parameters) and convolutive parameters. The convolutive and additive estimates are applied to the model adapter 21. The adapter 21 modifies the HMM models 13 and the adapted models are used for the speech recognition in the recognizer 11. The model adapter 21 includes a processor that operates on the sensed noise, performs the estimates and modifies the models from the HMM source 13.

Change paragraph 0029 as follows:

At the beginning of a recognition task in a particular noise and channel condition, the recognizer may be suddenly exposed to a new type of background noise and microphone. It may be hard ~~of~~ <u>for</u> the JAC algorithm to immediately give a good estimate of the channel after one utterance, since not enough statistics have been collected to represent the channel.

Change paragraph 0031 as follows:

A general equation to represent how $\overline{H}^{l}_{[i+1]}$ can slowly converge to $H^{l}[i+1]$ as more data is collected is,

$$\overline{H}^{l}_{[i+1]} = f(q, \eta, H^{l}_{[i+1]}, \overline{H}^{l}_{[i]}), \tag{10}$$

where η is an estimate of the sentence SNR. Our preferred method of embodiment uses the following equation

$$\overline{H}^{l}_{[i+1]} = \overline{H}^{l}_{[i]} + \omega(q, \eta) \cdot (H^{l}_{[i+1]} - \overline{H}^{l}_{[i]}), \tag{11}$$

where the function $\omega(q, \eta)$ is a weighting function which increases monotonically as the amount of collected channel statistics over q sentences increase. In our preferred method of embodiment, we use the following weighting function

$$\omega(q, \eta) = \frac{q}{Q(\eta)}, \tag{12}$$

where $Q(\eta)$ represents an SNR-dependent <u>integer</u> value.

Change paragraph 0032 as follows:

After $Q(\eta)$ <u>utterances</u> have been observed in a particular environment, we have sufficient statistics on the channel to allow for the channel estimate used in acoustic model compensation to be equal to the running channel estimate. As can be seen in equation 12, the function $\omega(q,\eta)$ increases monotonically and linearly with q to equal 1 after $Q(\eta)$ sentences. If speech is ~~clear~~ <u>clean</u> Q is small and if not good SNR Q is larger. If Q is 1000 and there are q=100 utterances the value is heavily discounted at ~~.01~~ <u>0.1</u>. If the value of q is small but SNR is good, then Q is small and the weighting function is large.

Change paragraph 0033 as follows:

In summary, in our preferred method of embodiment, after an SNR-dependent $Q(\eta)$ utterances have been recognized, we have $\bar{H}^l_{[i+1]} = H^l_{[i+1]}$. When $q < Q(\eta)$, $\bar{H}^l_{[i+1]}$ is given by

$$\bar{H}^l_{[i+1]} = \bar{H}^l_{[i]} + \frac{q}{Q(\eta)}(H^l_{[i+1]} - \bar{H}^l_{[i]}). \tag{13}$$

Change paragraph 0037 as follows:

This means mathematically that $\tilde{H}^l_{[i+1]}$ is a function of the unlimited channel estimate $\bar{H}^l_{[i+1]}$ and the sentence SNR η as follows,

$$\underline{\tilde{H}^l_{[i+1]}}\cancel{\tilde{H}^l_{[i+1]}} = g(\bar{H}^l_{[i+1]}, \eta), \tag{14}$$

where the function g is monotonically increasing with $\bar{H}^l_{[i+1]}$.

Change paragraph 0038 as follows:

In our preferred method of embodiment, we chose to limit the ranges that the JAC channel estimate can take by forcing it to be within the lower and upper limits and which are themselves functions of the sentence SNR. Equation 14 becomes then

$$\cancel{\tilde{H}^l_{[i+1]}} \cancel{=} \begin{cases} \tau_{\inf}(\eta) & if \quad \bar{H}^l_{[i+1]} < -\tau_{\inf}(\eta) \\ \cancel{\bar{H}^l_{[i+1]}} & \cancel{if \quad \tau_{\inf}(\eta) \le \tau_{\sup}(\eta)} \\ \tau_{\sup}(\eta) & if \quad \bar{H}^l_{[i+1]} \ge \tau_{\sup}(\eta). \end{cases}$$

$$\underline{\tilde{H}^l_{[i+1]} = \begin{cases} \tau_{\inf}(\eta) & if \quad \bar{H}^l_{[i+1]} < -\tau_{\inf}(\eta) \\ \bar{H}^l_{[i+1]} & if \quad \tau_{\inf}(\eta) \le H^l_{[i+1]} \le \tau_{\sup}(\eta) \\ \tau_{\sup}(\eta) & if \quad \bar{H}^l_{[i+1]} \ge \tau_{\sup}(\eta). \end{cases}} \tag{15}$$

Change paragraph 0042 as follows:

Between the limits it is made linear and above and below the limits it is constant. The values are constant. The determination of the limits is determined by experimentation. A value may be between zero and plus and minus 3db.